

Notice of Allowability

Application No.

09/746,328

Examiner

Hetul Patel

Applicant(s)

HOOPER, WILLIAM G.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Appeal Brief filed on 02 June 2005.
2. ☒ The allowed claim(s) is/are 1 and 3-18; renumbered as 1-4, 6-8, 5 and 9-17, respectively.
3. ☒ The drawings filed on 06 April 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

1. This action is responsive to the Appeal Brief filed on June 07, 2005. This response has been entered and carefully considered. Claims 1-18 are again presented for examination.
2. Claim 2 has been cancelled and claims 1, 3-18 are allowed and renumbered as 1-4, 6-8, 5 and 9-17, respectively.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
4. Authorization for this examiner's amendment was given in a telephone interview with Robert W Bergstrom (Reg. No. 39,906) on 08/29/2005.
5. The application has been amended as follows:

CLAIM 1 (Currently Amended):

A solid-state storage device comprising:

- a physical electronic memory including a spare table region containing spare tables, a spare page region containing spare pages, and a data page region containing data pages;
- said three regions are physically separate and distinct from each other;

- an electronic memory interface that provides, to devices that access the electronic memory, memory operations directed to target data blocks specified by the accessing device via a logical data block address; and
- a logic component that maps a logical data block address to a physical address describing the location of a data block in the electronic memory[.];
- wherein the logical data block address comprises:
 - o a page index that indexes a data page within the data page region, a spare table within the spare table region, and a spare page within the spare page region without searching for in a table search; and
 - o a data block index that indexes a data block within the data page indexed by the page index and a spare table element within the spare table indexed by the page index without searching for in a table search.

CLAIM 2 (Cancelled).

CLAIM 3 (Currently Amended): Replace the phrase “claim 2” with “claim 1”.

CLAIM 4 (Currently Amended): Replace the phrase “claim 2” with “claim 1”.

CLAIM 12 (Currently Amended):

A method for transforming a logical data block address into a physical electronic memory address, the method comprising:

- providing an electronic memory having a spare table region containing spare tables, a spare page region containing spare pages, and a data page region containing data pages;

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- said three regions are physically separate and distinct from each other;
- extracting a page index and a data block index from the logical data block address; and
- using the extracted page index and data block index to identify the address of a physical data block within the electronic memory corresponding to the logical data block address[.] ;
- wherein the logical data block address comprises:
 - o a page index that indexes a data page within the data page region, a spare table within the spare table region, and a spare page within the spare page region without searching for in a table search; and
 - o a data block index that indexes a data block within the data page indexed by the page index and a spare table element within the spare table indexed by the page index without searching for in a table search.

CLAIM 17 (Currently Amended):

A method for remapping a logical data block address to a different physical electronic memory address, the method comprising:

- providing an electronic memory having a spare table region containing spare tables, a spare page region containing spare pages, and a data page region containing data pages;
- said three regions are physically separate and distinct from each other;

- extracting a page index and a data block index from the logical data block address;
- using the extracted page index and data block index to select the address of a physical data block within a spare page in the spare page region of the electronic memory to which to remap the logical data block address; and
- storing indications within an element of a spare table corresponding to the logical data block address that remap the logical data block address to the selected address[.] ;
- wherein the logical data block address comprises:
 - o a page index that indexes a data page within the data page region, a spare table within the spare table region, and a spare page within the spare page region without searching for in a table search; and
 - o a data block index that indexes a data block within the data page indexed by the page index and a spare table element within the spare table indexed by the page index without searching for in a table search.

REASONS FOR ALLOWANCE

6. The following is an examiner's statement of reasons for allowance:

The prior arts of record do not teach nor suggest, either alone or in combination, **all** the limitations of the amended claims of the current invention (claims 1, 12 and 17);

particularly a solid-state storage device comprising physically separate and distinct spare tables, spare page regions and a normal data page regions and a logic component that maps a logical data block address to a physical address describing the location of a data block in the electronic memory; wherein the logical data block address comprises: a page index that indexes a data page within the data page region, a spare table within the spare table region, and a spare page within the spare page region without searching for in a table search; and a data block index that indexes a data block within the data page indexed by the page index and a spare table element within the spare table indexed by the page index without searching for in a table search.

Claims 3-11, 13-16 and 18 further limit the allowable independent claims. These claims are therefore allowable for the same reason as set forth above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hetul Patel whose telephone number is 571-272-4184. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'M. Anderson', with a long, sweeping horizontal line extending to the right.

MATTHEW D. ANDERSON
PRIMARY EXAMINER